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## **APPENDIX A**

# **Proposal of Adding a IR Mode Code Pre-Load Packet in Guide Plus+ System**

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## **Purpose:**

The current Guide Plus+ System has a built-in IR transmission function. It sends the preset IR signal to control the Cable Box or VCR. Because of the limited space in Sanyo microcontroller ROM size, we only store the selected Cable box and VCR IR codes after carefully reviewed. However, to consider that many new cable boxes and VCRs will be sold in the market every year, the Guide Plus+ system should have the ability to learn or accept new IR codes from Pre-Load Packet in VBI line. The content of IR Mode Code Pre-Load Packet will be discussed in details in the following "Format" section.

## **General Concept:**

In Guide Plus+ system, the external SRAM should reserve 200 bytes space for IR codes storage. Each of Cable Box IR code or VCR IR code occupies 100 bytes. Within the 100 bytes, the byte or bit to tell either VCR or Cable box and the whole set of data for the new mode should be included. The format of IR codes inside of the SRAM will be designed by Guide Plus+ developers.

The user who wants to received new IR codes for his/her VCR or Cable box should do the following four steps:

- (1) During setup Guide Plus+, in stead of entering Cable Box or VCR brand number, for example. 15-1, user has to enter the manufacturer's product serial number ( if using Guide Plus+ slave board\*) or pin number ( if using Stand-alone box\*). The Guide Plus+ system will know that user wants to received a new IR code for Cable Box or VCR. This number will be used to match the number from the IR Mode Code packet through VBI line.
- (2) Call our customer service center to request a new IR code.
- (3) Provide the 5-digit zip code.
- (4) Provide the manufacturer's product serial number or pin number.

After confirming the needs for new IR codes, the insertion center should generate the IR code packet and upload it to the insert (GES2) for that area. During downloading IR Mode Code Packet in the midnight, if both of zip code and serial/pin number are matched, the user's Guide Plus+ system will store the new IR code data into the SRAM. Tomorrow, the user will start using the new IR code.

- Assuming that the manufacturer's product serial number or pin number has at least 8 digit number.

## **Format:**

### **IR MODE CODE PRE-LOAD PACKET:**

Start Code : 1 byte, 07hex  
 Type : 1 byte, 7Chex  
 Country Code : 1 byte,  
 IR BN : 2 bytes, each byte is a coded hex number from 30hex to 3Fhex. It indicates the current block number of this new IR code.  
 PL Ext Byte : 1 byte the first 3 bits (bit 0 to bit 2) will show Packet Token for IR Mode Code Packet. The following is the illustration:

Packet Token	Corresponding Packet Type	Preload ID (000-FFFE)	Auxiliary PL ID Info Bit
110	IR Mode Code Packet	Host ID	Reserved

IR TBN : 2 bytes, each byte is a coded hex number from 30hex to 3Fhex. It indicates the total block number of this new IR code.  
 Signature : 3 bytes,  
 Content CS : 1 byte,  
 PL Pkt Ver No. : 1 byte,  
 Content : m bytes, the content of IR Mode Code Packet.  
 (The example given below uses zip code 91106, serial number 45562310, and device VCR. And the new IR mode data is in page 8.)

(I) Device and User Zip Code : 3 bytes,

Byte 0:	b7 b6 b5 b4 b3 b2 b1 b0	VCR (01) and the first digit is 9.
	P I d1 d0 z-3 z-2 z-1 z-0	(P 0 1 1 0 0 1)

Byte 1:	b7 b6 b5 b4 b3 b2 b1 b0	The 2nd and 3rd digits are 11,
	P z-6 z-5 z-4 z-3 z-2 z-1 z-0	(P 0 0 0 1 0 1 1)

Byte 2:	b7 b6 b5 b4 b3 b2 b1 b0	The 4th and 5th digits are 06,
	P z-6 z-5 z-4 z-3 z-2 z-1 z-0	(P 0 0 0 0 1 1 0)

d1 and d0 in Byte 0 indicate which device on this new IR code.

d1	d0	Device
0	0	Cable Box
0	1	VCR
1	0	TV
1	1	Aux.

The b0 to b3 of byte 0, and byte 1 and byte 2 are for user zip code. Each zip code represents 2 BCD digits of a zip code number. However, there is no offset value for user zip code.

(2) Serial or Pin Number : 4 bytes, total 8-digit number (45562310)

Byte 0:	b7 b6 b5 b4 b3 b2 b1 b0	The 1st and 2nd digits are 45
	P sn6 sn5 sn4 sn3 sn2 sn1 sn0	(P 0 1 0 1 1 0 1)

Byte 1:	b7 b6 b5 b4 b3 b2 b1 b0	The 3rd and 4th digits are 56
	P sn6 sn5 sn4 sn3 sn2 sn1 sn0	(P 0 1 1 1 0 0 0)

Byte 2:	b7 b6 b5 b4 b3 b2 b1 b0	The 5th and 6th digits are 23
	P sn6 sn5 sn4 sn3 sn2 sn1 sn0	(P 0 0 1 0 1 1 1)

Byte 3:	b7 b6 b5 b4 b3 b2 b1 b0	The 7th and 8th digits are 10
	P sn6 sn5 sn4 sn3 sn2 sn1 sn0	(P 0 0 0 1 0 1 0)

Each byte represents 2 BCD digits of a serial number or pin number.

(3) Total Bytes : 1 byte,

Byte 0:	b7 b6 b5 b4 b3 b2 b1 b0	Total bytes of IR code is 23 bytes
	P tb6 tb5 tb4 tb3 tb2 tb1 tb0	(P 0 0 1 0 1 1 1)

To specify the total bytes used in the IR Mode Code.

(4) Content of IR Code (CIC) : n bytes

each byte is a coded hex number from 50hex to 5Fhex. The bit0 to bit3 of the even byte in the following content of IR code (CIC) is the higher nibble in each byte of real IR mode data (the example of real IR mode data is shown in page 8). The bit0 to bit3 of the odd byte in the following content of IR code (CIC) is the lower nibble of each byte of real IR mode data.

(CIC)

Byte 0:	<table border="1"><tr><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>P</td><td>1</td><td>0</td><td>1</td><td>irb7</td><td>irb6</td><td>irb5</td><td>irb4</td></tr></table>	b7	b6	b5	b4	b3	b2	b1	b0	P	1	0	1	irb7	irb6	irb5	irb4	The first byte of IR code is 0 (P 1 0 1 0 0 0 0) (higher nibble)
b7	b6	b5	b4	b3	b2	b1	b0											
P	1	0	1	irb7	irb6	irb5	irb4											

Byte 1:	<table border="1"><tr><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>P</td><td>1</td><td>0</td><td>1</td><td>irb3</td><td>irb2</td><td>irb1</td><td>irb0</td></tr></table>	b7	b6	b5	b4	b3	b2	b1	b0	P	1	0	1	irb3	irb2	irb1	irb0	The first byte of IR code is 0 (P 1 0 1 0 0 0 0) (lower nibble)
b7	b6	b5	b4	b3	b2	b1	b0											
P	1	0	1	irb3	irb2	irb1	irb0											

Byte 2:	<table border="1"><tr><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>P</td><td>1</td><td>0</td><td>1</td><td>irb7</td><td>irb6</td><td>irb5</td><td>irb4</td></tr></table>	b7	b6	b5	b4	b3	b2	b1	b0	P	1	0	1	irb7	irb6	irb5	irb4	The 2nd byte of IR code is 137 (P 1 0 1 1 0 0 0) (higher nibble)
b7	b6	b5	b4	b3	b2	b1	b0											
P	1	0	1	irb7	irb6	irb5	irb4											

Byte 3:	<table border="1"><tr><td>b7</td><td>b6</td><td>b5</td><td>b4</td><td>b3</td><td>b2</td><td>b1</td><td>b0</td></tr><tr><td>P</td><td>1</td><td>0</td><td>1</td><td>irb3</td><td>irb2</td><td>irb1</td><td>irb0</td></tr></table>	b7	b6	b5	b4	b3	b2	b1	b0	P	1	0	1	irb3	irb2	irb1	irb0	The 2nd byte of IR code is 137 (P 1 0 1 1 0 0 1) (lower nibble)
b7	b6	b5	b4	b3	b2	b1	b0											
P	1	0	1	irb3	irb2	irb1	irb0											

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and so on.

Check Sum : 1 byte,  
Stop code : 1 byte, 0Fhex;  
XOR byte : 1 byte,

The next 4 pages is the detailed description of IR Mode Code.